

### REMARKS

By this amendment, claims 98, 102 have been amended. Applicants reserve the right to pursue the original claims and other claims in this and other applications.

Claim 98 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Han et al. (US 6,521,924). This rejection is respectfully traversed.

Claim 98 recites, *inter alia*, a method of forming an image sensor comprising the steps of “forming a pixel ...; forming an isolation region adjacent to said pixel; and forming an isolation gate over said isolation region.” (Emphasis added.) Han et al. does not teach or suggest this limitation. Han et al. discloses “image sensor 200 comprising a silicon substrate 202, a photo-sensing element 212, an isolation region 208, a transfer transistor 210 and a capacitor structure 230.” Col. 3, ln. 29-31. There is no isolation gate. Since Han et al. does not disclose all the limitations of claim 98, claim 98 is not anticipated by Han et al. Applicants respectfully request that the 35 U.S.C. § 102(e) rejection of claim 98 be withdrawn.

Claims 98-101 and 107-123 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Nozaki et al. (US 6,570,222). This rejection is respectfully traversed.

Claims 98, 107, and 119 recite, *inter alia*, a method of forming an image sensor comprising “forming an isolation gate.” Nozaki et al. does not teach or suggest this limitation. Nozaki is directed to the formation of a surface shield and blocking layer over a pixel and shows a “reset or address transistor” 13b. Col. 10, ln. 41-44. Transistor 13b of Nozaki is a reset or address transistor which is connected to region 24a, a Ti silicide film or region 21 which is a surface shield region. Since transistor 13b of Nozaki is a reset transistor, it is playing an active part in the operation of the pixel and is not there to reduce dark current and/or prevent charge from moving from one pixel to

another, as does the claimed isolation gate. Also, Nozaki describes a space 11a between an STI and signal storage region 15 which is used for conduction between a surface shield region and substrate 11 and further adds that region 15 can be expanded to fill in space 11a. Col. 8, ln. 56-58. To the contrary, claims 98, 107, and 119 recite "forming an isolation gate," which is used to inhibit electron flow.

Since Nozaki et al. does not disclose all the limitations of claims 98, 107, and 119, claims 98, 107, and 119 are not anticipated by Nozaki et al. Claims 99-101 depend from claim 98 and are patentable at least for the reasons mentioned above. Claims 108-118 depend from claim 107 and are patentable at least for the reasons mentioned above. Claims 120-123 depend from claim 119 and are patentable at least for the reasons mentioned above. Applicants respectfully request that the 35 U.S.C. § 102(e) rejection of claims 98-101 and 107-123 be withdrawn.

Claims 102-106 and 124-126 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nozaki et al. in view of Casper (US 5,835,433). This rejection is respectfully traversed. In order to establish a *prima facie* case of obviousness "the prior art reference (or references when combined) must teach or suggest all the claim limitations." M.P.E.P. §2142. Neither Nozaki et al. nor Casper, even when considered in combination, teach or suggest all limitations of independent claims 102 and 124.

Claims 102 and 124 recite, *inter alia*, "an isolation gate." Nozaki et al. does not teach or suggest this limitation. As discussed above regarding the patentability of claims 98, 107, and 119, Nozaki et al. teaches the formation of a surface shield and blocking layer over a pixel and shows a "reset or address transistor" 13b. Col. 10, ln. 41-44. There is no isolation gate. Nor is Casper cited for this limitation. Although Casper teaches the use of an isolation gate in general, there is nothing to teach or

suggest a relation between an isolation gate and a photodiode or an isolation region or their respective locations. Thus, Casper does not remedy the deficiency of Nozaki et al.

Further, there is no motivation to combine Nozaki et al. and Casper, as Nozaki et al. relates to solid state imaging devices, and Casper relates to an entirely different field of semiconductor memory devices. The claimed invention relates to isolation technology for CMOS image sensors.

Since Nozaki et al. and Casper do not teach or suggest all of the limitations of claims 102 and 124, claims 102 and 124 are not obvious over the cited references. Claims 103-106 depend from claim 102 and are patentable at least for the reasons mentioned above. Claims 125-126 depend from claim 124 and are patentable at least for the reasons mentioned above. Applicants respectfully request that the 35 U.S.C. § 103(a) rejection of claims 102-106 and 124-126 be withdrawn.

In view of the above amendment, Applicant believe the pending application is in condition for allowance.

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Respectfully submitted

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